

EP*#FJ#####{###?#####?#####x#?#?WU?##AD#?J?##?"4"?#?
N.?mj?"2"?##.?6?"Cm~k?t[+W?]+-?ū?UZ?%
[PR?a?m?>?{?;g#?;

??#g??<9?<??y?9?=?~+I?\??#?wT??#???Q:ω#s?d??\$????S????
?\$?jX??r?:s???L???N?Gu~??S?&G\7,??,M#&???IU?#Y???l#???5<I?|
?.U?,#???o?m?im[??1|
F2?lq]??&gj?R???\$*o?jkd#??}??d[?U?m?t?}??}^?d?(M)7&??S?[???9m?3:
???}??H^??????U"??m?w>7t????0?
9??'U?ib?@????;?S4?>;????Üi?#xf???\$#=\$?N?#?Rg\$#?6-?w?/?#?oX?g
? ? ? ? ajs???U?_cH+?C#????N?
w=z???(??)??W#???Mj?u~?P?:?>=Voj?#V?B~c#z?#y?e?
?xk?1?#????q'???W?bFu?w?>2?3??Æ^????<y?r#xEz??? ?o] |
&?M9F?so#?:???;ZOR?^#Fv1;b????]_??#???u4? ? ? ? ?#-zG7 ?
?+u+?#*C??6?: ? =?08v??#(?Q#?MiX?T?%?
Qv?T? ? iR#V#??) ?L?"Yk59] ?#???J?S???#?J?#%??1 ?#?#?#?h7i???K?'#??2
J??? ? ? ? ?)#?w"|Z??g\$CB[?1???##G?xL#| ? ? + ? ?
z?I#?#???{ ?<v?:povI???*???E?Q_N?#?, ?-?g?"???n?#>?u#??A J?
g???#?0?ye???n?0E?#???oD???P#???Q;?????4Lz]/=?#?nyu#????
#?ws??g?\$0?U?4??y{z?#?????4?3# "??#|#?F?
%`t{?d?#e^??<??Y??&?t?Ne?9.MV??e|

#f'G'o'V9'w"]9?\4&#kT+c8G?Jh_5?|
kch8#SAA#W#e2zZXF!d4[eU
%#)Y #~bx{>ni2[# *5e4[#=#ek;nQ=-##-
&y m#M#mC6m.W.`k#

U ^-T^+|x,"*
%+ yzu# `=4#j# #_#h#m,kq}h:ö#}
Qh5л0aVă=?*y0#YKs`Tt\$Uyũ#Q62o)
[)\3# 6/ T' qpGr((#c~# # # |q^GN
| # ~1- L M <h#g 8 ~4, :i % # 2 ^?
0sNqñ##b qn~.# G.`y#### 3{] 5nSE 99>
j |c#>? w M h { #: @##^ k; #v *Ä#) VY
% {B e*#A ,#e]) 9 ' #E< Q# X#3s ?&f#KS

??i#tC> #?f9Cg!0tD?o#S###>ž?##?z(^`öL#?
c:?'#>\o##~0000600I?v#S^?00000*##BA#c??%Ç?v??#|
W_?)>??[??S#???, ?<a{0Q#tw8??/M@a??,??##^?
##b#?h#?#?#V?j?1#!#?#?X??1??# ?#yCg?q1}##p??0>??#
?g??#??Z#?o#0??8??m??v9??"up ? ?L?/?<m?q{?#?|
?sI??= ?h#??L??#wyt ?0df??}g#? 3?1#??#c#_?#?Y]??/?M?j?-
##qk??xzx?A??#??#?5>?:?#]???
??+?o??#??#?s?#[?v##n?q?5??##??Z!?=???:?&?
6?=??cC?}??1)?#~n?ePQ#?#?(? ?V#)?~R~uf#V?V#:jS*##\?|??#?####r?e?
?3??a?s??N#??>?.?N?k?v?:??E13>|?E?mZ??#k??
%m?y#??#*??C??R??C?'U??o??#p?/?;?? ? ?;??#13??=y?'
?#p??##}Jy?>??>?#?]?(-z#?`#??q#??~]P#e?# ?J`
~?#r??#c[??#?U??{??tk ?m? 0 p>?Dyo#MY?w1??
o?TR ????2??l\$??e??Q#??w??8?QJ#[C??3??2?
??/?Vm??N?yS>Cz?Hx#??C#?[??X>?!??L>?TY?8?
=?7?Zx??X??c?YD?_?Hy??#~s??/t?92?? ?~??I?k#?
?#;##h?s??F?#?X#%]v??J_3?? ?^Y b?
?U^UymJE?5??p?h?:F?Ä?d??##/P#?b##?#?# ?x?C?Z????s?
??Z?D#67??}k(#k?N?

EE) #e8^#

;#g#xM#h+^#z#:s#G{'n#e)##f'
H8R8YXfXIdQ9mzG~n3~J.h3e"6VYU
YX. P97A!
d # tVVI{z7#
Gr3J)D`c#9S/>t\N7~c*4\##:*#[6R#y
P<iD5]s

3|wkKQ'qfppUX{ej#:@N q#[\~k
QAG#oTl'Z]cv'hmw<#
e=G4##<Hg#nM#6U=H#|X'oz2#!iS;
{r{^~{z5#S|Dz6s?
SlVhU#[i_s_D}cnس?
BUBaCc8l1dGWk}13, # C ~#Jx
m=0f0tX#ç#U&/G#1##[|X'\$\$\$##y
%wN#n\$ Y}8i?jt#j5z~l
ieZTt#=#d#7#y#IJE8#1#}l#ج? G#?#a'#.9jK6t
[h#&f4 fd&E3, dwR2]H{ ckk#V4#
#-b##ÿ#Hzg#F=Yp#FE6)

W3u"#c%0#cc1[*`%ũ0000# 000Z0T0V000)0#0-4!N~ /0
00000000000T\$00t\00v^>#F#08.+30i00?Vğ
0 40=ru0 >#05iL 90#0zU<0l=0#~z0,\$=0}0\$00'U#000 }
%#000000700o04400|
0/0m}0;00&0f_##0v0hk000000*{P000c0##00}F0q00`lD"J0#G0Z00000
0_000000<0H 0000!0 #20}!o0+00OKAe0:>0#0z0qT0
50C00b0\$00#07`_0}Y_0?0#}500j00X 00000=0;1`00k0ç00}00x##H000|
##0#000*01u00#k0S08e0#_`#0]0|-?
00c0}g+m#0K0w0g5,0;R000DŸ)#00#W00000000+4000b00<000D0'0<cj0
00<?{~EmJe00"[0V4#000kwgs;0w0e#0btG00|
0s0H00B00hmN0#000I0Z00!/0hP300 0ea 0: 0#s-
0Q00000#0C0z0g0##00h#0*J0z0R00G0y0G|[{0080z0Qw0R000+?
00M00'w000J,##000,0090#c^0#0PF[900h#0\000Vci70 d00000#0 0h çA
e000#m0n0d0*0<0\#|fQ00#0\00
0q0#0X0,80#Q00*0x#/100+000K0~009000002000 0#F00+0#G00A}\#-
000ê#00&00vY000X000#00a000o0'0#0000\#0!
[d08#,x0}0V]0Q0#:0000#*0J%0~00000W0|6t0cp1n7?
c000=0y00wY0f0#s0000y%0#0000#8000*00o000 U{00\h0-
W0Nn0J00 0xz06 0d0000E0>rK06v0f0o0B00Uiw00#;#0>0#00B0#/000G(0
070
0001#^00##cg00000#0#00/09T# 00g 07000#0I0'##!
0s0H07'00,00#0I00#0A J-
JOh0H\F0Ho&çmZ#00 E#00EG\0000#0St}m#"0#020#00002b0V0?035R0+0g

4#>ciAoozq6#_#Cw#6:
(#ezÄ[?H_!!U? e6h?7#1?0?
%...(c}#e&qG#}~gHj[8/?_h_Eq'##Б? e{ % #ow
}#!.Sb_{&?4L; }z#oo>0}!
o#y#s`q#?K#?A??0e?\??suO?h?#?g+??x? #?~
#{yn[# s4PZqn?f#6#g!c|?yynv?#? -
{c+??s?s????? 1??#??,ä?f??fP?

#3^?J{hR/9# #?#?[wN#lbfz^~]U
%f#N#o/m#/5G#ESon;Z#lR
<#w?|}a_m#wi0c!XW[>Nu\
:j?#dõ
:7j?T/9_Tp5=m#w

H_32#wssAW>#nb+ct#!ec#)##pvZ|
JBB}<>s)I'nhMBñxB*KKq?
#y[_}#x#`]c-##+##<?XB5vh.sDzmT
%uIwh#^!^
.v1.#Zf#{mH#K#6g'r#cvig*v|
ZfVW#W# I<#?+

#b#a#z#e#k#X4n#xp#U#{-|
ŠFqSE>spS#'Ir/##?#.#889\#N
Bp
%vIj#H#K5N*^##zz=MB;k#g#iWk#h,M#
#|c#k#S#t#V#Ÿ
P#V#6#XZ#Y#W#:#K#.#J<0#:F&/#z#y#-##
k#C:w|y93:X#g
o#mZ}##e#w*#7vú#wJ#;m<h%X~5z!
c#ybe,x#V#n6#\##F-
R9G/#oR#(k##Q#f#_?
=c>g9o#m#.##+C#X#A#{KE:Kce#?ceZE

#|.o}u#z]'#\tm#o3#'#2~"kq#,\##4[#^[(#
C#1#c#b>B#c#2#z#7U]1#i#'l1\$#yM_]?!
6#x#2#Gf#)yξ#:#7"#z#F;k#)#x#Q,o#]#k#
_#(+##U7#WB{e#}#`#(Cc{#|
#0#z#z#i#_#G)#c#q#>Vv#|##1|
k#v#<5#>#>#Q#<0#,##VYU#9#%#

???"w??? #?:wC?s{n}Qy?i
?T4??S?#{#_??#??+?e?J??#????#??Z#??J^??9*{?? ?M?#{?? t?
?B>è<?~?#?????#????5?'???u[?#]*?s??#?#9?V ?E?C01??N?
#j0]?úlw?y#?#?A#u@_V#??=???? [?#??{y}#????cy]?3??w?
 ?#??#?c?2??-?0?[w?#`?#??λ!
???#?I???o???P?>6#b?,???oQ?h??#?M#???v?#?6M

?#???c?}##??#9Q?}r???8?n?^???#??[??#?w??K?"??S??CY#i'2d?-
b#?!,s??#_#= >?aL?~?V?V???UI?#?
 ??##?????^AT??4?L??#~g?????V??c?&]?tc?
?)?n?SV7?]U#{q???/????&t????=?B?}???TE)?sT????[??#6^???#??K?#b
??/#?G#???#?/?g_8?????k?g???r<?w<?#?w???Q~?Kr?0<?*?n??G???D?
?~???*!{?/U??cew?
x???}#c?#?)?_Œ##amE??w?E#C????≥??? ;?#???j#?c,?#???##?y
_?~???qD?????n?z?

0b##cg0y#0q9.0w7F0_R0qI0GY 0\$0^q0pnD\0E"0c^0x0m00wQ000DSo
#000T:T000YX00.000

\$:u+##ThSFtK=8*3
;Eeef8"_{#VN#-
Q\qcbD#S_{.W9RFc*KadTUu/;v#>/7r
axg^T:M72)#P/##05#-dtez=m;^?
p#bKbv{9fg=#nwiqk)#b,I1`#F)A##'
;_v#f#5,,;##j#]#'#n`<n\p\F##3#oYf|
c#8(
J#^æÿ##S.ëi~(UNw##21#VUu#}0#E_
%d\ /F:,Z# 9?vk
}7}UU06f#g;_#* TQ##7 #
2Y#8+AAI]vm\##!4##xso p2
5.)#3ÿW;əg##P]#" }<7: #mz d
 j` s8Xvf#~mK~
u##k1#A##jbq}#X#6lW##z##[0
#HUU,MM

?:Zx#<#ZT#qX\4QUfbY'j89+
x#{M]s,~?M#miiW6Wwx#*??p??%YH@H@w"
[]AXh%p]eo

??-??x?' }1# (yjW#_??x

?

*Ncg^pXn#w1##=#Q4nSN#4#rS##wj+
#^vgB+n(w#g:h:^#yw*(=###_#

#;9nn#t1#####c7

{RS[Ru' b\$\$\$~kpr7R#b4#



5#^7#AiP>)[k|wo# p#c%# N

#x:;hZ#yc## ^ y<~#u

89#;Eef8)4 ? P{1. qhDZ:##X0#nB?
Q#kN8n`8AII'~'?QW#^jL#jAk'J`x
 Vuu#'#+^q^e ezc5\ L #Z_
U/VS:Iv'zj^#;\30}vqu<#:JIpj3#ZneZc0_#qr
0 %fkx#e

??)'VxI##N?\$&i#?0>&?Ω?? k?L?F????J^?J??#??#!
???7?s?* X???#??2?3U?e?0e=?{-Ä???#?yc?u?|
??b?#???i#??#??8?j?B???Es?_?#?#&??z??J?k?>?c0#w.c?ypŮC??#8#??
%??β?ZdL??f#s=λ#?en~?E#???I?????##P?*?+??1?U?h?#
}%???u?fx(sY?+??%??1?????_.#_Q????P4e]m] #r???"?Zn?
x?J???#)?u?l?:?Q??

Q`QHd-jB^QUB#B/Ij#~#i_??#|
##D##Yk6#f#BZt#(Z#,gcAcZh#?#/#i#t!
#c4:7zôz|###8#üU(?hi?e3_k)7uP#/?|?>/?+1?#?
P#hS*#t*x##I? 9?C [?a?+?H[Y#2?#i?*
eR KCjd2399#~9%?W+&?_F#\$Jc?9e!
#?1#,Q9?o\Pn<?_x?.0F#?#Zm3??=m#?1?-7?#?=Y?
Π\??*?*#?3? x?p#X?
} 2|,W??^?k%?w1??%?y?/G#??
_??rF6#?,S?L?c#k?AC><??V??R?~?h??D[??*[?z??7\??~???)^?{
Lv??t?B?,?
eQ??V#??YY#?yv??nõ? ?「?#9 ?A#r2?8??/?4?b:?[yp??J#qp????9
{??zC#?1 ?! ?i<?u?6`??#??mv?a]?#??2??_??#??
#??-?[??3?w?h????_?#?
{?{?4.?v????#?z~?'?#?? 7#?L#?I??S?7?#?đ?ç????b?^#?3#a?S??#??
VS?c###?G?!#?f1?#y?#?#?rN#2-Ûu
=u/?X?~\Θk??D%?X??I;?q]???Y?|?#Xv{?'ACY~?a?C>?e??##??'????

|qLx#KpUsv9mè~[^g#k_ia#wq{(=DyT4dAa}
 y###+&?|@y#Q_.F6lw<## Rz1'\$H |m#r
 .m#/>_`#]#c#/#x##}_A##4Y1N}#`--s>6Am#Zu\# 0
{mWx8<r\!us#2k~##%#<#V:#M#`kG&6"
1} /|| "##cy#11aQG#
9#Y+~K#@ p2dj^e^##_dk #4\$ {#4;3
#3Yi1F/#>VBg#1lT[***f#&#)#
 d##KN_(w##uMU]e o#^Z{G?H1b?s?##M>+v\
+##2vhA#YaH6ml#x=?
v*'}#####8#dV!#ys772####m#.-x}#Cu!
77p>V#BC#|
s#yn#t###q#m*#; ,m95#g6v##C`#X

,a#mJEX06G#r?*:mqN

>\#Wh#]hWo`#uCee#-j k-
N{~xF2l]Xm x`+##d##: {+ (##I`

=W#l h s g G=T U I6 =o # < u #M
%w h u n x k F r = # V 3 z n " # f 4 3 3 F s # M _ c H + C # u E 7 x X
4 E U ~) C

_, Sz:X# wM#[1(n?
n##m#0A, kU\c hl# \$l a r#<!/V6SF6VYU
???
#br0+;v; \ v uQ^=%Ig~#_U#dU, #
% #' ω<7X%l5p tw tx w!3##MC| #

9oF+5C#7 ;tYU ^F|9.#SS6##~jCUigE
~B##v#s:3c#

2v#c3#(8#0#W#]# 7M
 e#53p#]öw&gM/=EXy5_5f3]"R7
v"#k#jK~;ZNN#wHbf#*5Tf~#8^gSTf1
]++^]#oJdfk Fc/5L|
uK#[^7>#i
p#M=UP#S#j#o`#+Zö 5}ez -
S'PU'wtM{K#1m#c#v#k,V#Z#F#1N#-
[#4#.#Xz#c"3}<^\X#E]x1,I\7<
#D^7vÖT4_xoYL#+|
o}f#g_MWK4\$+9#^8#5/ys.G{#d5Q)#X
Qbn-y###3f1]XFsiG1#1#i#0}sh+Kw84&#:

??D5?k??#?##? t??=*??0?|ù?Z?q}?R#???d?j"?
?f#\$?:#?g?[^???#??1???=S?>?h?v???>V(!w?}
?<F????#???Se?7????4#? ?`?7??X?#?P##h?q#???#???*I?/?i#9#[a.?Y?
M???_X?Ö?#???=???v?o????s?RVZ?#?J#[???N|
?CW?`Cg>F?#?)?i[/???UG?T? ?|
????@???Uiw???#;?? ?##c#qf?P?9?Ct?tTN???? =?#?E?#???#?i???_R?SZ
?[???i???7???>(!?????s?i?9??

k#DSoN;?Zziiv+TW#tRC#::#QF80PF#-
sdoo9.#t\V,##*N,x231#Nwd.}a4[[h?
si##_#Z
#7~-@###[##^#Z,z=#}qMb#{E o#5zK?
!o!/TuoAZ,Bw'?##b}>ch_E=_
#8#{I=_#{!U#t#B :#Tl^ -
#u>}&T XGXwpQv/#eqvvvh#Q#s5hLzz}`
+o#^((o[_lm#bb#NF7z#QUr}}I###Wl#/
/+# b]}#'9Cm#n#k#W;#_1N# kğ)38#@#3mJEv
R?
 ,n@y##?!Я##61V p#23e#7hq' nXkfHo#?
j\##f KKYogc####Tc#E#~c22WrPa?s
 yEc~R4# # wkc#{cs##A>G;;q?
Z###\4SSEq9Y?ux^V4# : ? ###!# Ge5: >#
Δ'_~U7-Aom|p<:##GI#QD
2r:TbaM#MYT/qz,A#<-q{##'+q("##w
jUuLG==\$_xd`P#
%Oc^*k8 "V\$XH_L Gm#uE#hYI#4#wve
vV#V;" }T~RJRJ5)qq< L '#X q{|`x<
 a#####n |
u8<3`7UxGY#2'#s:y*IY#(<\c# # [>c,
|??Yy(MhznzO*lm=h)j "0o!'<8<N*a?
00&*#_ \51m7{xvy##vP< *u_o=

%_h? N95toZgZNN#=#v
 00000n1l\$ZvysPsl+ #~\D(FF_#5#0#x\^9!lS
?
#+^w&#lxs]8#*# =u#tX {Jd#:#:#~
#f86/Knzzi0!:#hk28\6

x>k#|
n+ŕrÔrGrE_++#kwwgw[?g>I
K>{ #+Nñ#*3C?9?
WxpnC r+ T#S-:RtjQ(# #
 #z^|] # # UXF#?
C0#a Xv\$^1># ' b(^Q#k0 fg>T^xSk#k-
 #FA)})}ni@wFez#M#^#U0^4et##g iM8#c#jY?
B-2Uf##]##U#9u: kE?tg8>9: \$!
R\W3 #!gg\ #!o#L#[# T-Nj #I #xJu?gR,
{m iuRM2[8#/_}=~S#i`* ;###W#0فJ##0Rf
Š # #NrW8QV m#^C: R#+k#p
z#; #6l/ylc=C#lT U zYv m?S#g#wl#T9: |
 .7# ' p?7 k#c#24 (<\$o# }X
3cQ#mJe(#7D?oMTu4 1t S mWp< UBN P# #o#8 غ
9C:) yM /c } E#8 # ?# # Šل-
 P9v& }ćS6p # ' ; # >KSG# #4: %p,
%cİ #J4 #M# \? p #0 ' k#" #/M+nC
 #u#wR x' - # !# # 'R# #B #b_SB j
: #x D<V #u# b t#PF# ## ? ' _8 Z

♠M♠<♠♠.♠♠|B#♠♠#♠v♠z♠##QFw♠♠♠♠#♠

<h aZ# [z x>#Uu, G(+u xH#l\p#u
Iø#Ae~G#E_% j#[` <L p {IUE_=}00}#

5w#g@E

z a I } Y _ } L U : o ' = c x # g \$ # l # z
k 5 V t / / i # , > y 0 |
M l # ~ = 0 4 K > # y I # # _ # C u m # /) # o _ # # y Z 8 s # /) # U x
{ Q Z

w#####%#B<#####k|c^\#####N96q?h#E(##.
 ſM(.2[#####H/;<Äb#####5³*>|e#r#####çT;y;{#####n#####
 J_#####OP#9#####e##### #

#####j ##Corso di Fisica II

Prova scritta del 17/02/09 I° modulo

Esercizio 1

Il sistema si comporta come uno spesso solenoide che consideriamo ideale, dal momento che non ne viene specificata la lunghezza. Al suo interno il campo magnetico è costante e diretto parallelamente all'asse del cilindro, al suo esterno il campo magnetico è nullo. Nella regione del conduttore il campo magnetico varia con continuità tra il valore all'interno e zero, secondo una legge che dipende da $J(r)$.

Ricordiamo che in questa configurazione il valore di campo magnetico in ogni punto dipende dalla corrente circolante negli strati cilindrici ad esso esterni.

Per un solenoide vale:

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

, dove N è il numero di spire, L la lunghezza del solenoide e I la corrente. Nel nostro caso c' è una distribuzione di corrente anziché le spire:

$$dx$$

$$dI$$

$$B$$

$$0$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

o

$$B = \frac{\mu_0 N I}{L}$$

Nella regione cava all'interno integriamo da R_1 a R_2 , poiché da per

$r < R_1$
 il contributo di corrente
 è nullo.
 Ne risulta
 Gauss

R
 R
 K
 B
 5
 2
 1
 2
 2
 0
 10
 77

\cdot
 3
 $)$
 $($
 2

\int
 \int

\int

\int
 Per
 $R_1 < r < R_2$:
 $^2)$
 $($
 2
 2
 2
 0
 r
 R
 K
 B

\int

\int
 All ' esterno
 il campo è zero e, difatti, l ' integrale si annulla.
 La differenza di potenziale tra la superficie interna e quella esterna è dovuta
 all ' effetto Hall, ovvero
 all ' interazione
 tra il campo magnetico e le cariche portatrici della corrente.
 Il campo magnetico
 produce una forza perpendicolare a se stesso e alla corrente: in questo caso gli
 elettroni subiscono una forza radiale. Dopo un tempo di transizione, si forma
 nel volume
 del
 cilindro una distribuzione di carica che genera un campo elettrico che produce
 una forza uguale ed
 opposta a quella magnetica: il processo diventa stazionario.
 Nel nostro
 caso corrente e campo magnetico sono tra loro perpendicolari, quindi possiamo
 lavorare
 sui
 moduli
 delle grandezze.
 Secondo Lorentz:

E
 vB
 q
 F
 \int
 \int

,dove
 E
 è il campo elettrico che agisce contro la forza magnetica;
 per trovare
 v
 ricordiamo che
 v
 e
 n
 v
 m
 q
 J
 Cu

\int
 \int

3
 , quindi
 Cu
 n
 e
 J
 v

\int

\cdot
 In definitiva
 $)$
 $($
 $)$
 $($
 $)$
 $($
 r
 B
 n
 e
 r
 J
 r
 E
 Cu

\int

\int
 ; sui moduli
 Cu
 n
 e
 r
 B
 r
 J
 r
 E

\int

```
#####?&#####x#}lV#Ej#c#(Tm
?V?#?;      n#?#?2?
```

n##d x p3 H .8 + c# # v# lA
8# s w > } m] & | 9 s3
3 # ` E < ^ l ` * < c # f \$ # > bZj# v # q D jk 8a U

wCdfū;Y}#^u:#!###)

h{žz\})#ao#vs0#YT##v^6?:+A#MJ
k#6#;ClG0.#mpp-(^##|k67\
{<hUA#Dn/#{#[b(8y!3#L&-#T1M?ak-
cM#3*;3v&#A###e`7v8 #h {
c v#}#C{o{#mn(;q:G,6w[;K{2Of%I's@q p
?4kF1k_?`qI##g5SVh`>#<#c,V#v>#Z#

X" #fx_4A m w#5 X m) # \$ * : 9 _ j , # # g b#kh j
! yYG#4?+ ? y<@#0 hrr#_+ # k P#fe #7] u D^
#X# F G # @ \ i j j+ rQ+c e N>#t-
~# z #Z bp #^ ># b{# :t# f #g-
: o6 v yx9 w]8 S / \ c 0 Y#{3q d (r ` s +qm
% B # # # v _ ŋ _ šn# x S !vu y \$ W Q H#@9< # -
#uUNE 0/ * ?#Q # # jx {# _ ^ e W!
 d # # 1 # K 1 [?
W= 3 Y # Qr1 (v]g#t 5 # u8 # I+ w # %6 # ` \${ # ^ #
 ipç F !Xms 6 _
 % _ p n <# ~# 7 A. E # F7 # ^#vp) C # r
 # 0! # n g # 5 w e # L {<# t ~#JA% t t 3 <
 % [E@ S ^# #w , #n#w # # 1
 %x#Pn w av o 4 y h= Y@ HE pRLi# RV\ #] !# 57M 7#\cS
 r #, b : d # # " ' r ? E 1 k 3 Mgr +9 # "y 3r u

?? 065?m#?7?n?]?#)?'??#+#nn#??X##?ut??r8 ?? ?&#_?j?#9?#k?
?;#????@c]??m2??vd???m#{???;=#???o???c???IGx\\3?#???p51<#???y##n?b
???v36?:?x##??#?lp(?????V?~#?#???@?????

dc#x# cP#5 њwce R' #c# њ=V 5 C : uM0 &_ *1 #h
i ##o =<#; ## њ#H = ~#L#Z #} ε# #n# 4

p>6R.ŷ#i=j=#(V]Aee#mk_Mc#!##r-
Pn##c#p0Uqww#R{";;m=}i[W oifKld
{##* /CFSd[{ ËN4ac##7aF~#K]r9#s
##[三`9##|######w!w~#s'M> R]'wN_|8cR%[\
{=\$~d°EEExzU

??e

NGn#8#t{wv'gdrwuu|
#_oYq#I}##7>zuuw;\$##R<\$ip1vb7 ?
~#Hg t##Hg -e'==t##Hg

5]#Microsoft Office Document Image Writer 11.03.1897.00 #2009:02:25
11:31:55#####
#####x8#####
#####_8#####h8#####p8#####(#####1###6###I##2####
###2J##/##p ##~8##0#####L##1##
###A##n#####{#####x##]UyIfH

Cq#####`4A%#@\$\$\$d#Ax

jX#H5>5
UT
J%jD*F

tGZ#6rV {u5s#dZ{ }Zc=>,"R i , , ,
л\$.П Jη[c+#Gp zJ[e!#t b # -
[.dfu#?# Yn#Qz#G0y)e j)'*LV4 =Pne
P.# #ND~ZQ ? L]##fS R W g R δ% Z -#WZ:h
9z6##0# eWw N>1> [6r s?x&t-?
NR8Y; tF2c tm/F})A7/00=+r x) w~ } F o
n#E| n x YN: B# ^#W. ?%. A1x?x^# |
RD#) #B#? j. ^+% n z N#D[P=J
'#J_ " * C n =T#cc# K P# x @#t
3z =# ## 0 J# C\ Rn # ## \# s r ## p0#. a7-` # c5#ZM

سA]û+##v1X##'X#}xQ#n"##
p[fx#e#-P#Ç*;C#N
>,##G0I3_Jf.PG'
#.#?y;Sip#]"##9nf(#y1[b{?
"#{di#nw#w#0y#w#d(##<[o?
Q~si{w#A#u04^K#''5F~ai#&wNÆ##
=#1RXr;c#fiY0??Ssq[.'qY<fP>#Nwf

#Sg+3#0#Y #<pTG7d0xqi#`#N#ZoW#B6
7n: 6 j:#849s:### B#me9{m
s##2kKw?w=)= [+3, [l##s4o?
\$~SE##6V} #m#X3#g#

Q#Q}:QzQ4['Q_Q_,#Q#Q,#{#Q\$QlQZcQ#y#4Y#Qz5#QmvQ#QwQ/#VQ!
GQ[!]h#oQtQ!Q-eVQMEdQ#QC#Q^b#|gQ#QEQQqQQQ#QQ2g#QB
#Q[EqQ#QkQH0hzQQ Q#Qc|GkQ##ZQQ;QQ?W QqFQCQj#QB#Q;Q
جQqTQbQQcfQeQU##Q QqpQ##Q ##QlQ6QeBaQ[&P{QQQ-
QvQaQdQcQdQ^QJQdQ#QiQoQ<##Q#<QQQQHQW+QJQ'^6QwQpfQQQ"QhQ
Q0#9#QwQ#4CQk=#QJ=QQXQQQ
QQQ Q Q# Q#Q)}}
جQQQ<QQfQsY0Q#QjQW^CQMlQsC]eQQ#QQQ{#z°QXQ#Q#Q\$X6QQQwQQQ:
QntG?j7Q#Q#QmQj?Q#QaQQQ86wQ#Q#/Q:#Q'Bkл]xQ#Q*=92;LQQVQ
%Q#Q#Qo#RQ#Q#Q[QET#^ Q{#nQ}Q#^+QQQQQ&QTQ-Q~|FQ
ق#QYQZQ#HQ)Q#Q#^'CQQQ##}QQ_HoQQZQQQ
Qp#QNQ)#4QQU#Q(QQO'QbQc\Q:x\YQ1QQcQQQq?QQgn#QQQq
%5Q#Q5hQQ#Q+wQU=QW-QOQю+Q%#W#QwmQQ# QJ^GJAQQQ!Q1Q%^QQ QQQ|
DzQQ%o#oQQ)\$PE/QQQQ4^Qk#hQQ#QQJQQ6QIQZQQ#QQ
HQQmQQ#QQGU QQQ. Q=#Q>QQ#QQ8QQQQMQ#QQ##QcsQ0 Q#QñQ7N]QQĚ
QQQQQBQCQQQMQRmg#NQeQ
6Z;Q#Q3lQQQ1#K#QQQqGQji\Q-
QJQs=.Q5Q_QQuIg&QQQQQ3Q,Q+QQfQ#QQQza-
{Q`QQWj\QNC_Q##yQeQQ#QQ{yQQQ%YQ##Q"zQ#QQQaQ QQ
'QlQx#QQQ#QbqQ}?
QQRQQRQQYD/QQ#Q#Qx<#QQQQ#QW=~FQQz#Q{"QQ#Q~#Q]># QGxQQQxQQQ\$Q
Qj Q#Q?QQ/Qó?QQ?QQzQQ!QQKQ7QKQ7Q#QRQQqQQQ)} Q

^}1^}<j_(r_#_#,#,##e#
%##_;=#/#z#~^p<#/Uo8#7##K#D#]K8^3Q
\$cooo1Sok-xoo.?
<o#uu,#1Cee##<#]0 b]<#iu@~T-
JEEz4W|jy=yP-
pZw}^~*W#ICv"qm7##MgûnnjaSA1#=#
WGrmUuu"?rT-Zy#g=#
|n| #A12}c ? d<uLW#k5#SM#48#M&m=

??x?2?P????#??e?"?W??Y??#M?CL?_?Sg5ψ#???y_9R?#x?w?h#?:A?\?
?F?###;Gv\I}?sd[{n#? ??##??#<x?õg_?=Hw?+U??0w7?|?????
Y<?#?R?Ĥi?[9G#????
??be?+|V?b??Qyr?\$?#?#?d?`?#;OR?L?Zi?\??P??

e,{##0S #n]cŷ#
q{##8*:*Kee({##Eei#l#o##8V
kk<#?prr.#Lue.#u9o جJFsuuN{E]GG#
xEznS##Wy,X1 y##2#pn)eoG
ZFvY##:ay##%8]U##>S#(#s##|h##A']#0##E

#G#0]##5}

o<dB#####2#cZP5Cи##7D#=
>0/#nD #N#r['~T1@##yU#n#F#e8W\ec*
##r."|X8J.##,###;|`!###
`0^B#}

#;#?T#GAsFk#{u[e#m#a#w}n#t~#
v;=j#
#U#H#J#+#=#@#_#Hh#è%#v^?
#M#_##k#xw#Q#I#f#N#Z#Zz#Ri#+#V#W##z
0##x#g#B#C,t#:.##<q#NZG,##n#&
#{Vy#p:#jeL#e#u#

gB}A#Ei ?`zJME{t

??!j#?yz

1_~%c,Tyx@L##[#Sp?
#p8>dG>#mr#fi#zFeW###"c};
9TQ#z7xq~##q&3X[?##40,>_HuD
:"#"##t)YdI>##D##<:'/#7#`##)S
:
:0#6tY:##_Bt.(K{Tg}##Y7hcn-
wid#l>;e-##F#N+g}w1###c##8+[]0c#C#h#|
~g7S2>;3##3aen2##2y^-]ip:)y

wv+MM|

5I6!μ(S%/9-

##[57?a >S+53#####

?#]#l>Hmy!;nByi#{#;F@L!%³\""
o;V#s#T"^^#Sr.Qx&'è#tRM
%eêu;k#;|Y@3#EC,##y*z P~
:VkDZg=[vxΓW4f,?' +hΛ#~&a_a>0y%.e8rey]u|
?`w1_3U7s^*WhC x 1Xi xl n%]-?
+08]#L j#n8?#

??#.R??o?? ?#?K??}??#?!?i?k#>????v?6?#?#???#?Px??##?
4{#?#?^?~#??K2?2?E]?pb?#?5??<`3{???##?
n#???BgJ??)???#?#?#_???. #X?<?.??s#;U??,?;??}#?M;?q#h'?##? ?
>`?G#R?-#???##??WA?s?h?w???#????C?S??\$???z?[?#x???#?>) ?
^???? ?/?9#ra3??<7ô{`9?y??w?)1?#4:##xN?? -?zj?%?#
_?#?##?c1I??#? 3<q? (~:??#`G??3
?}#?#0x?q??#?wq?w#?????-Z??#?#?#?#1Y##<

c}C#t

M3^#####M#a#S#;v#^ #####uM#R#PGl#žp#4DfVh###m
35# [(T v\$'#5"YF
]#####Q#####1#^##### yjW<#x'#####1X\ '#y{##^ {
#`k`#{u95!Z_ ;m}P######

M####Á#..dd,#%%dY#,,.PP~_4JJ>#P#T !o#|
k0##x\Z#wJ2V_s#xD9|3

n#####:##### u#?'#x#####G###[P##



h_(%#<n13I w}8Iuu^!#5d b 1:N G(C8#0~0
%#8x #L~o#o#I5
%#;#~--Waũ'k2B#y!yN c
J_I3##Q# # ## e?> #ص S?
Ms>G"xM* _ 7U G];IYF0Jy##B f*Q:@
%'VY# #/zM #ow* # # #K` # ##6 p c;]|
h8Y3" #A8c. 7-z #I##C8:{ { C8^#f,e S Y5YN
) * #U91MS v4|#] # i e: L ` ù #5 # |
#0y>
 #G# #k^ l kç|
 04m~ Iη [qv # "Lb #: q m c} @< #U #X
 i
c c ## # ## Ki## (#XL##k~] ŷ ŭ G #7 # > US * t
{ c`xi q##B<f!SBX 3 #eX[# g q K G0z?
' ` #<# #Θ
, # # #m# c 3 { ` ƒ Π ##4#* j ## 8 7 t @ [± # h!
 3 #E / \XA h + #} * [x7 5 x # 2 <#gN# # #3># r o` |
3 , - ð) # # ~-v P P P 1° #m \#Z #
%.. q 2v#bлn # C#< nc x F m0.e

ph8E#y8#3#{

??G?_?? #b=?A3?g##?y7?X??V?#Z7?#?'? nk?
??P?#???R?5&?be5????;Dy?vn#

??j?e??.əs???*???X?#???#r??4??#?W?{??ed^???8?.1u?0}? ? ?!
G?#?#?a}#?##?g)?x<??i
C??1?5#?s?5?##?Bt?C?f#???<???P?c#A \ s ?#?#?#L?H????
?u???0?N|??[b?u*o?b???D??m#zB>#c???#im#*???C???ω^???j???
R?#?'#?BYY??#?;????

Q+Q/Q#Q#Q#Q#Q#G(QQ"Q(Q1N/QQ0Q:Q4fg'Q3fQmQsQ:;Q3QsQ:#QQHQ#Q#
5QyQ[<Qo;QQQQ#Q#KQy58bQBQr.#~Q(QVxQd#Q3Q#Q#W#xO#Q#Q
JQ#Q#xg#xQ(QLQ#Q;Y0~1Q#QLQ
QVuQ2#Q\Q#oQ

0#? u`

W6l###!e11B!F@#CJ^# ,D#x?HGv
*JM?Rxs#qjlU%#s#z/ehY?
QOI. #>1: #Γy c \zm#~#YPf|
Kki"C" | W F{>#~[?#=:lJ#Lb<- %xt>iy
Vss#_yX~CZV- ejEV^
Uj!گk-Xy" (U/- %m -0# a# #Q#
 j0^Q1
6Z# # ^8#Gz#FX3RyN3aح- Y
9V\W' q{\W�#l rz.

MCC^jjcs

#/t1====7]yy^5Tl?yo%ú#X+># ,1kL%#+h#k f]
MQnD-####y##1#c+ 0"3#;?_

Q;C??#/ Q#Q#i|V??m##???!-QL??#&7I~?-[Q*QiJQ}QžQms#Q'Q#??
%#ph8?44?#z??? 9?#7Eb=#Q#QL(Q#W##>KQ=??vQω,#Q Q#2???#?
<#??LQ{QS??b??(X??a????
Qx????JQxQ#Q:#g??N?KQ|h#Q"&Q?4???U2QRQt??j
6iQ{?bQ_RQY<Qn_j?mQ}Q#??Q'?!Q7?? #&#|#??sQ:??mQO?e??}Q}Q8b
[]??K?5Q #Q#??B?N[??+Q>Y??/C??|??#žug??l?S?rQ/ص}??wQ?
#??|}LIQ=#??gh?mb?2f~?VQ^?o`QE??V?~t[]G??#?????#z}??-[]kk[]#
%?????_??#??#?hPQ/?V|
??Ga??jQ&Q}Q{Q`??##/?##????)J/?l#??#??wQ)X9vU
%se??#^??#eQ[#????:@R??u??aQ=Jл-}Q%??|????#)Q'QF?????iyQ.
[]??lM??UQ#?5Q}[]Q!%[]????##oN?mQ[]??#?W??t?
Q#Q^#Q#Q#??~£????YQ.kQ[]??pQiQ}??2zQ\Q#Z[?b??????ZW?P??[?W?~?
{##Q#~[?QU?I????rQ#^#??s??Zg1UQ|
Q)Q+?u????#??jy??Z?J????+5??V????}#o8?g?gQ?U??~???
a?WQ[]?[]?# QJ?gQ[-?^}gE ???Q?eQU?OQ+Q}~'#???#Q
??#=#cQGkwQ>#>?m?c????d8ns?e??[]??\$wQF+?çgQnQ

o#2 S}nnX%]vv#g#iD\$#Lg#

? # _ W` < E# - Z0 ġq V wX S n0e k< f # Θ Y
 0#_# @#|# /0 o# #\#^ #4 ۛ R\$* | Q #n h| # "
 #p 6 F; H # È_ #/ W . tx t# #) h s B] \ | \ +
 Ag g h# m v { V ~ [# # # ?
 # } L g (; # < \$ " ' T 2 o 1 G D o I ; ŷ T ٬ Ny Һ n# < . _ .
 x F# < ~ [# 0 # 2 # # n = 0

##v(x,/ -#dXeḣC

u#}#|#p?urmc-9j>#%s0MX8#q|
7 o,,;N4PGRlj9]U1==/^AA} <#K~F~woR
 I h, τ#m fu#=Bp48J# #1+%3v#

##;vP|
o***#300(1#[#E:76>hh4z`~32;_T3
3{ç#^Uqwwpp[~yyL&#e;#:#(gv8#x|
u#6#kd4#eM_)zRT0wuY"6khh#C# 0##
1# k v ># # + # # @ 1 # # >##yI+ " }d#
4A_EjC#C!#wRGG# # # # #] 9B#n# # # ?<P
PByb%;4_#;6\uw# # # # #0##o) \$Ž#n) ' '
 s a #8N>: | #8; S . Y# 'c# ##i#mk#a9
b\] r; # {hR>, g<# # # } g z #C#Z e ~ & #v v ?
s5v. 6 w p# # # # # † w ~ Q K c6 = ' [I / # # # j \ b -
Z U #E # # # u _ (9 y \ 1 # # y f # + # g = p # X _ a * #08
22SU# #71;v#] + z # } <: # @ # # \$ { t
(3) # x # X # S ^
w # # # # # Yk U9 Q (4 O v P # #

♣#m5#♣♣Cd♣

0#Z)YNN~+}??3M!
x_?*~wX}a5AAw#H1f|&(F;#Eggh
?]N#a#[GG=y?Ky#
![]#~P#tqL6#_zS<]!!`[L#6S?8ef#|
cxR~#I#K##T\}h#_w#{Û~-\\-#+#~0_*\\^uDL17#Xk~o?
6##<I#-`Yc#6_w`~#~x\\#
%#JWb~#~)M`Y#k'1_!#G^Fxxkka>*#?
o##k7?.%H+
{B645cpio#o##YZ[gL#9Bz2#cmm_#

#/#/0G} \\s^zF_SJ)#Ir_bf{B#h3Nw#I#;bÈ##+?
#G#5#`WG/om2?
mg#S#HY#*6=P#k"bnnA#CŪPoC#B3I#\\#n:CU:O
=<!#AwX#u##R#~JWY9
i##4B.z?o{]jl;B#+#y?
9x>#~F#e`*gKaMw&P X##QY2Zb-
]A# 7#È`a#?
E#t'E9tz' b2g*M#GfLz#-
sKkg\\Lm#Lb|E>RRe|
bÖC}ttX##Ni~J*2#@#"#b.t
(#Y#v6?B#A?7D#)##b{1%S5Hg`&"5M]!
l#4#|S [\\~#4/#<!#A# EÇ+#+>o## q5|
#aa#L7 e>u
, % .EN3#LX8#`~Qs{#~X<#Nw#kSj6ŭ##dM
-Td(-6@@#/#/Qc9ē1;c#)oyC

?75++C? \s>\#: # 0w4}SccQ87#o#HφJX&Y
2&0Ss*0 [oN x#0U xg\1 st}nU#>##+?CJ#?
) :0s#)dZvЦ#m p)LH+##5!|## %1T(cf
##U6|n.DzJ~# \~u5ds#?Z} `=
l,/dg;\4~#*##1m# ;* ;wVwMw`' #w9o#
0oR>iV#o` + 'R
p1# ##j} V R B##r #3#s?

Q\$Q#Q#QUrUQnQkbQ8QaQLQ#Q#Q#U9QKzDQ-Q#QkQ5N#6ZQ
Qy=QWxnQ#Q#Q+k;QMvQçQjQ"QkQ-
QVQ\W'Y#zQrQjQ. QhQ#QL Q-Q7QdQ
QB#Q#7Q+QFyQ

??w?#!?HŸ??2g\?4??^\$??'??##?]y?e?B?#b??y?X??ö?#b?#? ?P??
~-?#??#?#?# /???<vro??#q?d?A?}?V??S?}?L?M|@F?#@r3?L? ?
%b?B1?#???{?*? ????#?##?o??5_ij?
c?(u'? ? 1 ??]??C?{???-???6B#A??G?d~]????h#???#???
#??CZ?p?#;????#??[?m? ?c?^ ?t?-
^??VW^?#? ?m##?Q??EF?I????#\w?#?z '#V+?x??N?i??X?3f?&??#??#
{??1G???V???? f?~?????#?e}0s??r?
5Ky?????#~#GpB??#?cz??K??
e?1#Z?#???~z??t??W{E?? i??+9???[_]#j????k?? ? 6?k?d
??#m/?KS? ;

??Ks6vX?wT?#?#%^??
?{?#??z??'5a e?W?;???| -
f??#8j?.??)0??^/?#?#6?V?'[o?wH##??o?"??wj?h?u???x}I#y1#T?
?-?J???)#SC?#??tGD?#??9??0(??.??,? 6Zy?o?#?ب
6?v??a\$??]n!4?0?#?/
m?t?
?v?^=a?o?#Z?#5?*?:??z~??r??s?r}??D??#~[??k(9#zs[#?^
4?) t??r n?!{r#>?? 8 #c0#?"??=b??#??MQ`?
??g?5e?J?{??/? ?m"#??E??z?^A?r?-#N??6?|.8#??x?
??Cû?#g>?#?R??_Q"|
?6>??J?<&??7#8+#?=7?cú??Q??9??y#p? q###??s 9@ ??#??#}p
w] ?A+>?C#?C?r?p#? ?d??#?' /ǎ?×?up?AC??ep?, ?!
?C??H?J#7*?8uég?H?##/?0z?#??8?^?xL?g[??6??#??
?)l;p1?#8}??2ω?q?#??r=? ?eb??.x? ?#o?? 'ž&?ǰ<?X?Pū+_ ????D?
?D|n?.?#U?@???[#???i
???k??#???g5#x\$~?#Z#, Sy?dfZ"??#??J??#??|
?, ??BvN??+??X?2????
?ž??UM??#??`1??~{?r?W???'_N??3?#??oB??k??F?#??P-??_?
?R??+??#??o?/GY13??1#?(??\?

?0??6?#?N?v?-?] ?`??#x?JA?C&??#?q??#??N#??#??m?#r?`##.YD ?
?b?t?l?c#??#{D??<?c]#??o?] ?>d?] ? ?
?#h??GY?TB??#??#p?']J?B5?#?_ ? ?uk?0?]??1??ω?B?_b????Hn?#
?J+9??7?00ô??r??_C?????>qw-
#??c? ?=-_?İ ?{?1#v??#0???;GY??%M?)??'<?#=?#æ?\?#?/d? ?
???#?Z?#?@J#
??o?#????} ?Z??-???)?h?#Uv?#_??uC^ZL#_???#??d?)??(?#)R
/?w??I? k@0#c????#}??#8a?
???? ?dk#G?? Po#zroB0+ #6Z=????=?S?r?|p??j?H3#?#W??iA
“?1?~&?1?W?T#?W??_?#?#??X0#? #aKIs{#M`?b?N?7Z??~??M?m?5I

□
□
□
□
□
□
□
□

3

3

□
□
□
□
□
□
□
□

6

□
□
□
□
□
□
□

3

6

□

□

□

□

Esercizio 2

La configurazione di lastre piane parallele di superficie indefinita (o di lato molto grande rispetto alla distanza) può essere studiata con l' approssimazione di piano infinito uniformemente carico.

Il campo prodotto da una superficie carica è

0

2

□

□

6

E

, come è facilmente ricavabile dal teorema di Gauss.

In questo caso ci sono due lastre con densità superficiale diverse e dello stesso segno.

Definiamo l' asse x come la retta perpendicolare alle due lastre.

Dividiamo lo spazio in tre regioni:

□

La regione I a sinistra della prima lastra

□

La regione II tra le due piastre

□

La regione III a destra della seconda lastra

Nella regione I il campo totale è parallelo all' asse x, diretto verso sinistra e di modulo

uguale alla

somma dei moduli dei singoli campi:

m

V

E

3
10
6
.
22
2
5
0
□
6
6
□
□
.

Nella regione II il campo totale è parallelo all ' asse x, diretto verso sinistra e di modulo uguale alla differenza:

m
V
E
3
10
6
.
13
2
3
0
□
6
6
□
□

Nella regione III il campo totale è parallelo all ' asse x, diretto verso destra e uguale in modulo al campo della regione I.

Si noti che il campo non dipende dalla distanza d, almeno finché rimane valida l ' ipotesi di piano conduttore infinito.

Per trovare la posizione di equilibrio in presenza di una molla bisogna eguagliare il modulo della forza (qui attrattiva) della molla e di quella (qui repulsiva) elettrica.

La forza agente sulla molla è sulle due estremità, quindi bisogna introdurre un fattore $\frac{1}{2}$ rispetto alla situazione in cui la forza sia applicata a una molla vincolata (nel qual caso il vincolo provvede a fornire una forza uguale e contraria a quella agente all ' altro capo della molla).

Per la forza elettrica assumiamo che una delle due lastre sia la generatrice del campo e che sull ' altra si trovi la carica di prova.

S
Eq
Kx
0
2
2
4
2
1
□
□
6

6

, da cui

m

x

7

10

40

.

2

6

Per il potenziale si integra il campo elettrico nell ' intervallo di spazio. Ricordando che il campo elettrico è costante,

mV

x

E

V

regioneII

26

.

3

6

6

.

La lastra a potenziale maggiore è quella di destra.

#####*#####x#kpU#1\$B7&!#nb"-#D8*
N####AJ#Eli(#K{i}0^##:T*#!#'_-ls
c k'##s fPl-
rn*# C#" /B34EE' #Q)IYYRl}x6#-
VwLwLw, #w' }0-
#wT##]=r&h v#oRL#i:ltM Zp#Gà#

??t#2.]#??_?^?H?{??t??#7[&???78?dK??' s#?Mn_y
??#??#re7?##??o?-?'7??#???ôG?3*?I???g???7v?\$1???8ص#|?Ÿ-
??){????#|=??#?*???)v#H??c5:??L?#?T?0???ti`#???##??#?lvc?RV\$?
ص??}??wy??s20n?<3%?? R]?α?????Ĥ?ᵛDN?#?1??5?;-?:1?Nnw????#??
?#?#?c??R#??7#?Hr?A?

??d??-)???e??#_##_#&#|???C?#??,0?g7X?:?(?
?na?Y?:?R?K??~=\$"?fr?#
???#??? f?'/00u;c?X??f?A#\+G?#s#sA?Z-?]G????#??k?i
?%?g??,?WX??2?p?d#y? #? #2K?_#???z#?>?z?F?dx??b?DFJ??'5?#???#P?
?قخ?_#m#i??!5#?1?9?@D#?6?#?i}???v?[?]??Bn7#S??#???qi[#s>?^??J?
?}:#?_?-#?????#>?M????##? }P6v#??###'?#ax?c????<??{96?y?
?Mw0?]??#???w?9????#?#?\H?]s#?~
?5j?}#s??i?8??#????qφ?r?h?&>#?8#?U?6?My????S?#?<?#X0?3,ε?
?????@?????'#?1v?SM&F1ki?g_?#f
?@?2pL???K?d#?#?#/???7?\#?B?X??3?#????z
L#'???b????z??^F?????#?)_????3?????`?]m? p?3v#w=?n??2????
?`'0?:??χFg#k?cnVE??L?J?#P??`????#?ob????#?#?#?#?

5@u} (q i2 A?# V |
#*#####QYw r q7c Y gi B#g

x##IiN:~

>'i@Lt9##^#X, #0##P3###Pj5]##:RR#j^#
}i,s}P{o4m1kL?
G}Li9=#tlt##:XR#U#]_#5}##Ä[#L'Ž
_##Qwyr)YU;V!
V//## #o#/IYLN{GRxzz9,j[k#
/ :Z' MnD^#u@g%x#, #jB#m# #]+#q_ <6#mL
 }]{#P#[y
#v{v^ - ##~ Q##`jnd##<>##
2GGN##-5hb##

4f#De#ZzU#}qkx%I\$#q1ZCzSRR#B/##@?
#^{_|_#e=#nVJfu/;NN.rwYi
PΘaJNBDD>h##c#|
"##XM}w#\#x;d/QFe\$gl53rD}#~Xj>j8-;?
H7jooU ٢joMlψy#v^[[lw7m'y'1
q#op{<n'{Cg0q#'\#z31`#3Q#;oOb9[1
N#Kp3;~2fvM1c *z_#f @0#a#

◆##3p◆

??_, a??0#a#?

###p#r#o#p#2###B###

###p#r#o#p#3#####?#DICT?|

#####?Vy#?0?#?#?Oh??0##
#@#####(#####?0#####8#####?#####
###??#####ş?0h#??##+'?0###\#####0###p#r#o#p#3
#####

[illegible]

###P#a#o#l#o#####*###5##-k##"#####n#####1#####S###%#
#1#####%#####H#V##\$##0##]###2###
#2#0#####

#q##\##*###}k##3#####n#####0#####T##%##l#

#X#

####?###%###?####?`##?####A?)##M##E#####?##J##?##a##?##&##?##|##?#
#y###

#####&##p#w##

#}C#

#?##"##&##%##&###G###p###?##?#####?##a#p?f##P##?##`###p####
#&##Z